We Energies
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February 10, 2014

Submitted Electronically

Mr. Ronald Jordan
Office of Water, Engineering and Analysis Division
United States Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Mail Code: 4303T
Washington, DC 20460

RE: STEAM ELECTRIC EFFLUENT LIMITATIONS GUIDELINES (ELG) RULEMAKING ADDITIONAL INFORMATION TO SUPPORT WE ENERGIES COMMENTS: PLEASANT PRAIRIE POWER PLANT FGD WASTEWATER CHARACTERIZATION AND TREATMENT PERFORMANCE

Dear Mr. Jordan:

We received your letter dated January 17, 2014, requesting additional information with respect to flue gas desulfurization (FGD) wastewater characterization and treatment performance at We Energies Pleasant Prairie Power Plant (Pleasant Prairie). As you recall, we submitted substantial data and supplemental information for Pleasant Prairie's FGD chemical precipitation wastewater treatment system as part of our comments on the United States Environmental Protection Agency's (EPA) proposed rule to revise technology-based effluent limitations guidelines (ELG) and standards for the steam electric power generating point source category (see We Energies Comments on EPA Proposed Effluent Limitations Guidelines, September 20, 2013). Pleasant Prairie solely burns subbituminous coal, and actual operating data reveal that Pleasant Prairie cannot consistently meet the proposed arsenic and mercury limitations associated with EPA's proposed chemical precipitation technology option. This is particularly important because the limits derived for arsenic and mercury are carried over and used as the limits for the chemical precipitation plus biological treatment technology option. We reiterate that EPA should recalculate the proposed limitations including data from a plant solely burning subbituminous coal. Below are our responses to your questions.

1. Please explain why there are no arsenic data for the Pleasant Prairie Power Plant for the "Reaction Tank #1 Influent" after November 2009, or for "FGD WWTS Effluent – SP 102" for the time period between November 18, 2009 and January 4, 2013. EPA requests that We Energies provide data associated with these sampling locations for the specific time period, if available.

All available arsenic data for the two specified sampling points representing the influent to and effluent from the Pleasant Prairie FGD chemical precipitation wastewater treatment system were submitted to the EPA as part of We Energies ELG comments.

Reaction Tank #1 Influent

Pleasant Prairie's Wisconsin Pollutant Discharge Elimination System (WPDES) Permit (WPDES Permit No. WI-0043583-06-1) does not require arsenic monitoring at the influent to the FGD wastewater treatment system. Therefore, *all* data collected at the Reaction Tank #1 Influent for *other purposes* (e.g., wastewater treatment plant performance test results, research projects, etc.), were provided to EPA as part of ELG comments submitted by We Energies. No additional data representing the influent to the FGD wastewater treatment system have been collected since November 2009.

FGD WWTS Effluent – SP 102

The WPDES Permit required a monitoring scan of various parameters to be conducted at the effluent from the FGD wastewater treatment system (Sampling Point 102) once the FGD system became operational (see WPDES Permit No. WI-0043583-06-1, Permit Condition 4.3). The monitoring scan, including an analysis for Total Recoverable Arsenic, was conducted on November 13, 2007, and results were submitted to the Wisconsin Department of Natural Resources. This data was included as part of the We Energies ELG comments submittal. The WPDES Permit does not require any additional arsenic monitoring of the effluent from the FGD wastewater treatment system.[1] The rest of the data included as part of the We Energies ELG comments submittal was collected for *other purposes*. A split sample was collected on November 18, 2009 during an EPA/UWAG sampling event. Additional samples were collected at Sampling Point 102 from January 2013 – April 2013 to support development of an Application for a Variance of the Anticipated Arsenic Limitation at Outfall 001. This data was collected to satisfy the variance application requirements specified in s. NR 200.22,Wisconsin Administrative Code, Information to be Included in an Application for a Variance.

> "A permittee applying for a variance shall supply the following information… Results of monitoring data for the pollutant for which the permittee is seeking a variance which represents the past and ***current*** levels of effluent quality."
> s. NR 200.22(1)(e), Wis. Adm. Code (emphasis added)

Therefore, *all* data collected at the FGD WWTS Effluent – SP 102 were provided to EPA as part of We Energies ELG comments. No additional data representing the effluent from the FGD wastewater treatment plant at that sampling point have been collected during these "gap" periods or since April 2013.

2. EPA requests that We Energies provide all available existing data for arsenic and mercury representing the influent to and effluent from Pleasant Prairie Power Plant's

[1] Total Recoverable Arsenic is required to be monitored monthly at *either* Sampling Point 102 (effluent from the FGD chemical precipitation wastewater treatment system) or Outfall 001 (combined discharge of all internal sampling points and cooling tower blowdown to Lake Michigan). We Energies made the decision to monitor arsenic at Outfall 001 and the data have been submitted to the Wisconsin Department of Natural Resources on monthly Discharge Monitoring Reports.

chemical precipitation system for FGD wastewater, for the period January 2012 through December 2013, that have not already been submitted to EPA. Please also provide the supplemental information for these data described in Attachment 1.

As discussed previously, all available existing arsenic data for the specified sampling points representing the influent to and effluent from Pleasant Prairie's FGD wastewater treatment system have already been provided to the EPA as part of We Energies ELG comments submittal. Additional data representing the arsenic concentration at the secondary clarifier effluent are included in Attachment 1. The supplemental information for these data is included in Enclosure I.

Additional mercury data is available characterizing Pleasant Prairie's FGD wastewater treatment system **effluent** because the WPDES permit requires mercury samples to be collected twice a week at Sampling Point 102 to demonstrate compliance with the 1.5 µg/L (1500 ng/L) best professional judgment limit. The We Energies ELG comments submittal included all available mercury data from November 7, 2007 through July 24, 2013. All available mercury data from Sampling Point 102 that were not already submitted to EPA, which includes samples from July 31, 2013 – December 18, 2013, are included in Attachment 1. Also included in Attachment 1 is additional mercury data for the secondary clarifier effluent. The supplemental information for these data is included in Enclosure I. No additional mercury data representing the **influent** to Pleasant Prairie's FGD wastewater treatment system are available for the period January 2012 through December 2013. All available existing mercury data at this sampling location have already been provided to the EPA as part of We Energies ELG comments submittal.

3. Please identify the organosulfide additive (e.g., vendor trade name) used in the FGD wastewater treatment system corresponding to the data submitted with We Energies' comments and to the data requested above in #1 and #2.

Since the installation of the Pleasant Prairie wastewater treatment system, three types of organosulfide chemical additive have been used: TMT 15 (made by Degussa AG), Nalmet 1689 (made by Nalco Chemical Company), and Metclear MR2405 (made by GE Betz Inc.). The periods corresponding to the various organosulfide chemical additives used at the time are described in the table below:

Date Range	Organosulfide Chemical Additive Used in Pleasant Prairie FGD WWTS
Oct. 2007 to Apr. 2010	TMT 15
Apr. 2010 to Oct. 3, 2010	Nalmet 1689
Oct. 3, 2010 to Dec. 30, 2010	Metclear MR2405
Dec. 30, 2010 to Feb. 16, 2012	Nalmet 1689
Feb. 16, 2012 to Present	Metclear MR2405

4. Please provide the specifications that are used to determine appropriate coals for use at the plant (i.e., specify the factors that limit the use of specific coals at the plant, such as chlorine content or sulfur content).

Pleasant Prairie is designed and permitted to be fueled with subbituminous coal from the Powder River Basin in Wyoming and Montana. The coal is purchased using specifications which define the allowable ranges for heating value, ash, moisture, and sulfur content. Those values are included in the table below:

Specifications for Pleasant Prairie Subbituminous PRB Coal	
Heating Value (BTU/lb)	8,000 – 9,600
Ash Content (%)	3 – 8
Moisture Content (%)	20 – 35
Sulfur Content (%)	0.10 – 0.60

Additional coal quality information is reviewed when We Energies considers sourcing coal from a different mine to evaluate how other constituents will impact plant operations and to confirm that permit requirements can be met. Typical coal quality information for the mines supplying coal to Pleasant Prairie in 2012 and 2013 are included in Enclosure II.

5. Please provide the type and source (i.e., mine name and location) of coal used at the plant each day from January 2012 through December 2013. In addition, please provide the sulfur and chlorine content of the coal used at the plant for each day of this period, if available. For days where coal blending occurred, please note the percentage of each type of coal used.

Coal was delivered to Pleasant Prairie from three mines in 2012 and 2013:

Mine Name	**Mine Owner**	**Powder River Basin Coal Seam**	**Location**
Caballo Mine	Peabody Energy Corporation	Smith	20 miles southeast of Gillette, Wyoming
Cordero Rojo Mine	Cloud Peak Energy	Wyodak	25 miles south of Gillette, Wyoming
North Antelope Rochelle Mine	Peabody Energy Corporation	Wyodak-Anderson	65 miles south of Gillette, Wyoming

The coal is shipped via rail, and coal samples are collected from each train shipment to characterize the heat content, ash, moisture, and sulfur content.

The plant does not track the percentage of coal used from each mine on a daily basis. Coal can be fed directly from the train shipments for immediate use in the boilers, or it can be

unloaded to outdoor storage and reclaimed almost immediately or pushed onto the pile and commingled with the existing inventory. Therefore, we cannot provide the exact breakdown of chlorine and sulfur content from the coal burned on a daily basis. The sulfur content of the coal from *each train shipment* is provided in Attachment 2.

Chlorine content is not characterized for each train shipment; however chloride content is characterized on a quarterly basis for annual air emission inventory calculations. A sample is collected from each train shipment and the samples representing the coal from each mine are composited and analyzed for a number of parameters, including chloride. The chloride content of the coal from *each quarterly sample* is provided in Attachment 3. Also included are the analyses for other parameters (i.e., arsenic, mercury, selenium, etc.).

6. Please provide the following information for each day within the range of sampling results that have been or are being provided, if available:

a. Chloride concentration, pH, and average daily oxidation-reduction potential (ORP) values within each FGD scrubber system;

b. Chloride concentration, pH, and average daily ORP values for the influent to the FGD wastewater treatment system; and

c. Electric generation output (MW-hr) for each generating unit serviced by a FGD system.

Please see Attachment 4 for the available information.

Chloride concentrations, pH values, and oxidation-reduction potential (ORP) values were provided for each FGD absorber when data were available. Data were not available on certain days for a variety of reasons (i.e., unit offline due to scheduled or forced outages, unit offline due to economic reasons, work schedules of chemistry technicians, etc.). The chloride concentrations reported on Attachment 4 were the results of daily grab sample analyses. Samples were within an acceptable range if the chloride concentration was <15,000 mg/L. Only one sample collected during the range of sampling results was higher than this maximum allowed value. The pH is monitored within each FGD scrubber system via in-line instrumentation and should be within the range of 5.5 – 6.0 SU. A grab sample was collected each day and analyzed for pH to verify that the instrumentation was providing accurate readings. The results of the daily pH grab samples were provided in Attachment 4. There are a few outliers, but generally, the pH maintained a steady value between 5.5 and 6.0 SU. Daily ORP values were available dating back to March 2013. No samples were collected prior to this date. Samples were within an acceptable range if the ORP value was in between 75 and 350 mV. All results were within the acceptable range.

Chloride concentration, pH, and average daily ORP values were not available for the influent to the FGD wastewater treatment system; however, if these values were available, each would likely be very similar to the absorber data.

The gross electric generation output for each generating unit was specified in Attachment 4.

If you have any questions or need additional information, please contact Alison Castronovo at (414) 221-4337 or by email at alison.castronovo@we-energies.com.

Sincerely,

David M. Lee, P.E.
Manager – Water Quality

Enclosures

cc: Bruce W. Ramme, Ph.D., P.E., Vice President – Environmental, We Energies
Kathleen Standen, Manager – Environmental Regulatory, We Energies

Enclosure I – Supplemental Information for Additional Analytical Data Submittal for the Steam Electric Generating Effluent Guidelines Rulemaking, Pleasant Prairie FGD Wastewater Data

The supplemental information accompanying the Pleasant Prairie FGD wastewater data submittal is supplied below.

Plant Survey ID (from the *Questionnaire for the Steam Electric Effluent Guidelines*): 6283

Plant Name: We Energies Pleasant Prairie Power Plant ("Pleasant Prairie")

SE Unit IDs associated with each sample (based on responses to the *Questionnaire for the Steam Electric Effluent Guidelines*): SE Unit-1 and SE Unit-2

FGD System ID associated with each sample (based on responses to the *Questionnaire for the Steam Electric Effluent Guidelines*): FGD-1 and FGD-2 (Note: FGD-1 services SE Unit-1 and FGD-2 services SE Unit-2)

Type of fuel(s) burned (e.g., bituminous coal, petroleum coke) in the associated unit(s) represented by the samples and the relative contribution of each fuel on the days of sampling: Pleasant Prairie is a coal-fired power plant that burns subbituminous (also known as Powder River Basin or "PRB") coal in each of its two generating units. The plant also burns bottom and fly ash from older power plants to reclaim some of the carbon in the ash. The old ash is burned at approximately one to two percent weight of the total fuel burned.

As described in our letter, PRB coal from three specific mines (Caballo Mine, Cordero Rojo Mine, and North Antelope Rochelle Mine) were delivered and used in 2012 and 2013. The plant does not track the percentage of coal used from each mine on a daily basis.

Electrical generation (MW-hrs) for each generating unit contributing to the FGD wastewater flow on the day of sample collection: See Attachment 4 for the gross electrical generation output for each generating unit.

Chemicals and dosages added to the treatment system, including location of injection points: Chemical additives are specified on Table 1 below.

Table 1: PPPP FGD WWTP Chemical Additives

Injection Point	Chemical Additive	Average Dose Concentration (g/L)	Average Addition Rate (gpd or lb/day)
Reaction Tank #1	Hydrated Lime	1.4	670 lb/day
Primary Clarifier	GE Betz Polyfloc AE1703 (Polymer)	0.02	1.07 gpd
Reaction Tank #2	GE Metclear MR2405 (Organosulfide)	0.048	2.43 gpd
Reaction Tank #2	Hydrochloric Acid	0.012	1.9 gpd
Reaction Tank #3	Ferric Chloride	0.15	15.2 gpd
Flash Mix Tank	GE Betz Polyfloc AE1703 (Polymer)	0.0035	0.19 gpd

Process flow diagram of the system sampled, including identifying the specific sample locations for which data are being provided: A process flow diagram of the PPPP FGD wastewater treatment system sampled is included as Figure 1. The specific sample points are described and identified on the process flow diagram. Additionally, the sample point descriptions are included for each sample on the spreadsheet.

Laboratory reports associated with the sampling data: The laboratory reports are enclosed as Attachment I-1.

Identification of whether any data or supplemental information submitted to EPA is considered confidential business information: None of the data or supplemental information is considered confidential business information.

Other Comments:

All available arsenic and mercury data representing Pleasant Prairie's FGD wastewater for the period January 2012 through December 2013, that have not already been submitted to EPA, are provided on Attachment 1. Data is provided, where available, for the following two locations:

- Internal point within the FGD Wastewater Treatment System (Secondary Clarifier Effluent);
- Effluent from the FGD Wastewater Treatment System (SP 102).

No data representing the influent to the FGD wastewater treatment system (Reaction Tank #1 Influent) or Primary Clarifier Effluent are available for the time frame.

Data is organized alphabetically (by analyte), by sampling location (in chronological order through the treatment system), and by sample collection date (in chronological order). One line is devoted to each parameter at each sampling location for each day. For instances when

multiple samples were collected during the day (e.g., results reported for mercury at SP 102 which include the collection of a sample and field duplicate), the average of the data is provided. These instances are called out on the spreadsheet in the "Qualifier Description" column, believed to be the logical place to specify comments associated with the data using EPA's format. For calculating the averages, we used the same methodology EPA used, as described on page 10-5 – 10-6 of the 2013 TDD. All results less than the quantification limit (i.e., the J-values and nondetects below the method detection limit) were treated as half of the sample-specific quantification limit when calculating the average.

The data reflect typical operating conditions and are representative of a properly operated chemical precipitation treatment system.

All pollutants were analyzed by the We Energies Laboratory Services (DNR Certification Number 241329000). Arsenic was analyzed using Analytical Method EPA 6020A, Inductively Coupled Plasma Dynamic Reaction Cell Mass Spectrometry (ICP-DRC-MS), as allowed by Chapter NR 219 of the Wisconsin Administrative Code, which specifies the analytical test methods and procedures applicable to effluent limitations for discharges from point sources. Mercury was analyzed using Analytical Method EPA 245.7, as allowed by the Wisconsin DNR. A permit condition in Pleasant Prairie's Wisconsin Pollutant Discharge Elimination System (WPDES) Permit (Permit # WI-0043583-06-1) allows for Analytical Method EPA 245.7 to be used for mercury monitoring.

> "**1.2.2.1 Mercury Monitoring.** NOTE: Because the mercury concentration from the FGD treatment system will be at a higher concentration than at Outfall 001, the permittee may use a less sensitive analytical method (EPA method 245.7) for mercury analysis at Sampling Point 102, in accordance with s. NR 106.145(10)(b), Wis. Adm. Code." 2006 PPPP Permit at 3.

The regulation specified in permit condition 1.2.2.1 is provided below.

> The analytical method used shall be sensitive enough ***to quantify mercury concentrations in the sample*** or mercury concentrations down to the lowest water quality criterion found in ch. NR 105, whichever is greater. s. NR 106.145(10)(b), Wis. Adm. Code (emphasis added).

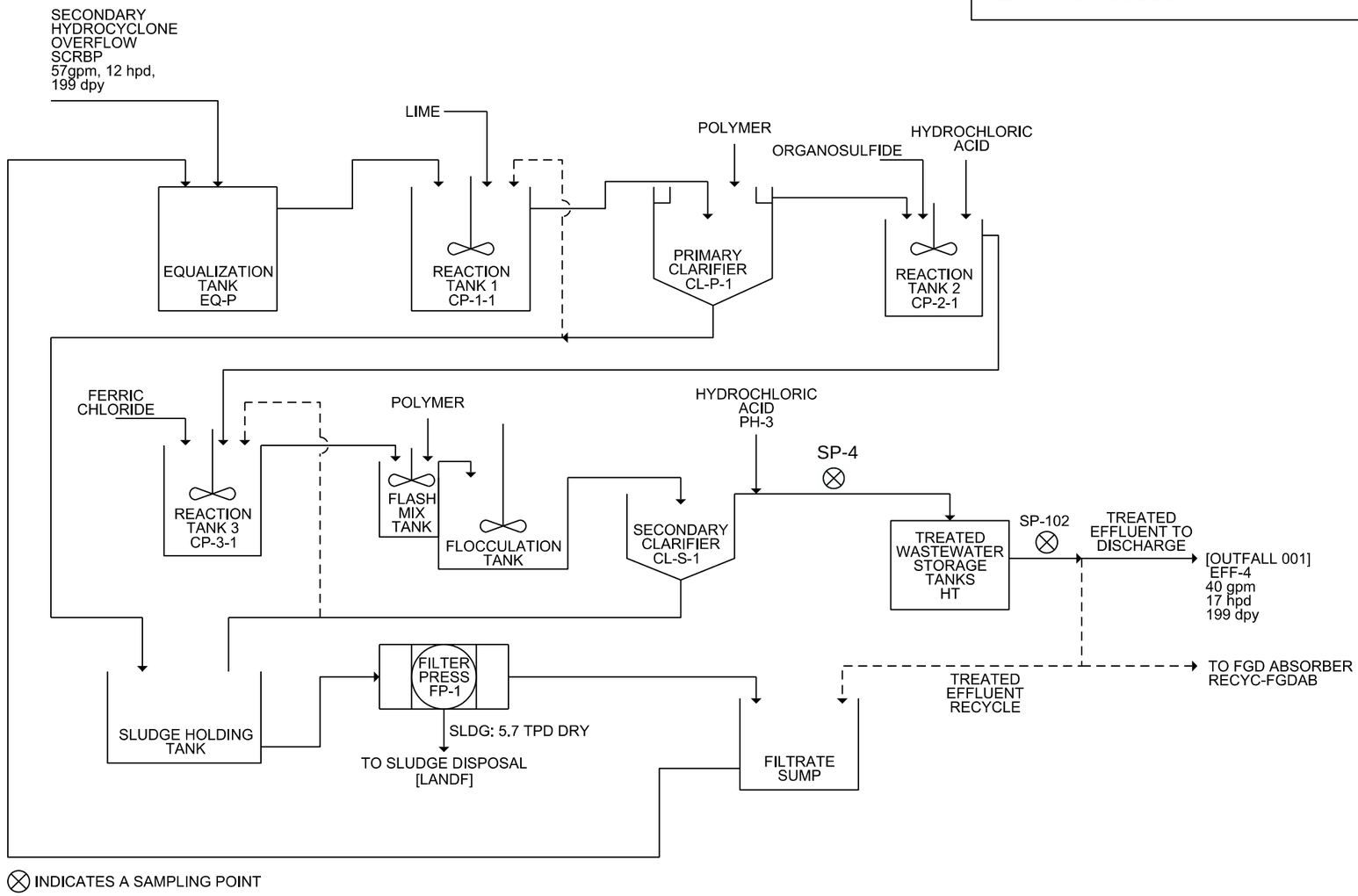
The flow rate at the sampling location at the time of the sample collection is accurately provided for Sampling Point 102. This value corresponds to the flow rate reported on the monthly Discharge Monitoring Reports. The site does not keep records of the flow rates through the internal sampling points, but generally operates the treatment plant at a steady flow rate of approximately 40 gpm. This flow rate was translated to 57,600 gpd, assuming 24-hour

operation, and provided as the “flow rate at the sampling location at the time of sample collection” for Secondary Clarifier Effluent. (It should be noted that the treatment plant typically does not operate for 24 continuous hours. As denoted on the *Questionnaire*, the treatment plant typically discharges at a rate of 40 gpm, 17 hpd, 199 dpy. Thus, if the flow was normalized to 24 hours per day and 365 days per year, the normalized flow rate would be 22,244 gpd.)

Figure 1: Process Flow Diagram of the PPPP FGD WWTS sampled

WWT-2

D-2
PLEASANT PRAIRIE POWER PLANT
PLANT ID: 06283



Sample Point Number and Description
SP-4 - Secondary Clarifier Effluent
SP-102 - WPDES Permit Designated Sampling Point - SP102 - FGD Treated Effluent Discharge

Attachment I-1: Laboratory Reports Associated with the Sampling Data

To: Robert Muehlenkamp
P145

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Thursday, January 23, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 11/14/12 :

Sample Description: **P4 CKD FGD WWTP Effluent**
Sample ID: AD61976 Serial/Impact ID: 0
Sample Collector: ANDERSON Sample Collection Date: 11/7/12 Collection Time: 14:35

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Dissolved Arsenic	9.3	0.11	ug/L		EPA 6020A	12/11/12	MJL
Dissolved Mercury <0.2um	91	13	ng/L		EPA 245.7	12/1/12	GAL
Dissolved Mercury <0.45um	74	13	ng/L		EPA 245.7	12/1/12	GAL
Dissolved Selenium	3400	13	ug/L		EPA 6010C	11/30/12	MJL
Total Arsenic	8.6	0.11	ug/L		EPA 6020A	12/11/12	MJL
Total Mercury	96	13	ng/L		EPA 245.7	12/1/12	GAL
Total Selenium	3300	13	ug/L		EPA 6010C	11/30/12	MJL

Sample Comments:

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Robert Muehlenkamp
P145

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Thursday, January 23, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 11/14/12 :

Sample Description: **P4 CKD FGD WWTP Effluent**
Sample ID: AD61983 Serial/Impact ID: 0
Sample Collector: ANDERSON Sample Collection Date: 11/9/12 Collection Time: 13:00

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Dissolved Arsenic	8.1	0.11	ug/L		EPA 6020A	12/11/12	MJL
Dissolved Mercury <0.2um	58	13	ng/L		EPA 245.7	12/1/12	GAL
Dissolved Mercury <0.45um	54	13	ng/L		EPA 245.7	12/1/12	GAL
Dissolved Selenium	2800	13	ug/L		EPA 6010C	11/30/12	MJL
Total Arsenic	8.8	0.11	ug/L		EPA 6020A	12/11/12	MJL
Total Mercury	67	13	ng/L		EPA 245.7	12/1/12	GAL
Total Selenium	2800	13	ug/L		EPA 6010C	11/30/12	MJL

Sample Comments:

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Robert Muehlenkamp
P145

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Thursday, January 23, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 11/20/12 :

Sample Description: **P4 CKD FGD WWTP Effluent**
Sample ID: AD62237 Serial/Impact ID: 0
Sample Collector: ANDERSON Sample Collection Date: 11/13/12 Collection Time: 07:35

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Dissolved Arsenic	9.7	0.11	ug/L		EPA 6020A	12/19/12	MJL
Dissolved Mercury <0.2um	54	13	ng/L		EPA 245.7	12/1/12	GAL
Dissolved Mercury <0.45um	63	13	ng/L		EPA 245.7	12/1/12	GAL
Dissolved Selenium	3200	13	ug/L		EPA 6010C	12/12/12	MJL
Total Arsenic	8.9	0.11	ug/L		EPA 6020A	12/19/12	MJL
Total Mercury	93	13	ng/L		EPA 245.7	12/1/12	GAL
Total Selenium	3000	13	ug/L		EPA 6010C	12/12/12	MJL

Sample Comments:

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Robert Muehlenkamp
P145

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Thursday, January 23, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 11/27/12 :

Sample Description: **P4 CKD FGD WWTP Effluent**
Sample ID: AD62441 Serial/Impact ID: 0
Sample Collector: ANDERSON Sample Collection Date: 11/20/12 Collection Time: 07:55

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Dissolved Arsenic	8.6	0.11	ug/L		EPA 6020A	12/19/12	MJL
Dissolved Mercury <0.2um	63	13	ng/L		EPA 245.7	12/1/12	GAL
Dissolved Mercury <0.45um	53	13	ng/L		EPA 245.7	12/1/12	GAL
Dissolved Selenium	3200	13	ug/L		EPA 6010C	12/12/12	MJL
Total Arsenic	8.7	0.11	ug/L		EPA 6020A	12/19/12	MJL
Total Mercury	88	13	ng/L		EPA 245.7	12/1/12	GAL
Total Selenium	3100	13	ug/L		EPA 6010C	12/12/12	MJL

Sample Comments:

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Robert Muehlenkamp
P145

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Thursday, January 23, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 1/18/13 :

Sample Description: **P4 CKD Unit 1 FGD WWTP Effluent**
Sample ID: AD63989 Serial/Impact ID: 0
Sample Collector: NF Sample Collection Date: 1/3/13 Collection Time: 08:08

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Dissolved Arsenic	12	0.11	ug/L		EPA 6020A	2/6/13	MJL
Dissolved Mercury <0.2um	330	13	ng/L		EPA 245.7	1/31/13	GAL
Dissolved Mercury <0.45um	300	13	ng/L		EPA 245.7	1/31/13	GAL
Dissolved Selenium	2800	13	ug/L		EPA 6010C	1/26/13	MJL
Total Arsenic	14	0.11	ug/L		EPA 6020A	2/6/13	MJL
Total Mercury	360	13	ng/L		EPA 245.7	1/31/13	GAL
Total Selenium	2900	13	ug/L		EPA 6010C	1/26/13	MJL

Sample Comments:

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Robert Muehlenkamp
P145

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Thursday, January 23, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 1/18/13 :

Sample Description: **P4 CKD Unit 1 FGD WWTP Effluent**
Sample ID: AD63996 Serial/Impact ID: 0
Sample Collector: NF Sample Collection Date: 1/8/13 Collection Time: 07:18

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Dissolved Arsenic	14	0.11	ug/L		EPA 6020A	2/6/13	MJL
Dissolved Mercury <0.2um	91	13	ng/L		EPA 245.7	1/31/13	GAL
Dissolved Mercury <0.45um	76	13	ng/L		EPA 245.7	1/31/13	GAL
Dissolved Selenium	2700	13	ug/L		EPA 6010C	1/26/13	MJL
Total Arsenic	14	0.11	ug/L		EPA 6020A	2/6/13	MJL
Total Mercury	82	13	ng/L		EPA 245.7	1/31/13	GAL
Total Selenium	2800	13	ug/L		EPA 6010C	1/26/13	MJL

Sample Comments:

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Robert Muehlenkamp
P145

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Thursday, January 23, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 1/18/13 :

Sample Description: **P4 CKD Unit 1 FGD WWTP Effluent**
Sample ID: AD64003 Serial/Impact ID: 0
Sample Collector: NF Sample Collection Date: 1/10/13 Collection Time: 06:36

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Dissolved Arsenic	14	0.11	ug/L		EPA 6020A	2/6/13	MJL
Dissolved Mercury <0.2um	87	13	ng/L		EPA 245.7	1/31/13	GAL
Dissolved Mercury <0.45um	78	13	ng/L		EPA 245.7	1/31/13	GAL
Dissolved Selenium	2800	13	ug/L		EPA 6010C	1/26/13	MJL
Total Arsenic	15	0.11	ug/L		EPA 6020A	2/6/13	MJL
Total Mercury	89	13	ng/L		EPA 245.7	1/31/13	GAL
Total Selenium	2800	13	ug/L		EPA 6010C	1/26/13	MJL

Sample Comments:

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Robert Muehlenkamp
P145

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Thursday, January 23, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 2/20/13 :

Sample Description: **P4 CKD Unit 1 FGD WWTP Effluent**
Sample ID: AD65488 Serial/Impact ID: 0
Sample Collector: NF Sample Collection Date: 1/30/13 Collection Time: 09:45

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Dissolved Arsenic	8.2	0.11	ug/L		EPA 6020A	3/8/13	MJL
Dissolved Mercury <0.2um	190	11	ng/L		EPA 245.7	2/26/13	MJL
Dissolved Mercury <0.45um	200	11	ng/L		EPA 245.7	2/26/13	MJL
Dissolved Selenium	2300	13	ug/L		EPA 6010C	3/1/13	KAV
Total Arsenic	8.6	0.11	ug/L		EPA 6020A	3/8/13	MJL
Total Mercury	210	11	ng/L		EPA 245.7	2/26/13	MJL
Total Selenium	2300	13	ug/L		EPA 6010C	3/6/13	KAV

Sample Comments:

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Robert Muehlenkamp
P145

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Thursday, January 23, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 2/20/13 :

Sample Description: **P4 CKD Unit 1 FGD WWTP Effluent**
Sample ID: AD65501 Serial/Impact ID: 0
Sample Collector: NF Sample Collection Date: 2/5/13 Collection Time: 12:35

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Dissolved Arsenic	9.0	0.11	ug/L		EPA 6020A	3/8/13	MJL
Dissolved Mercury <0.2um	150	11	ng/L		EPA 245.7	2/26/13	MJL
Dissolved Mercury <0.45um	140	11	ng/L		EPA 245.7	2/26/13	MJL
Dissolved Selenium	2800	13	ug/L		EPA 6010C	3/1/13	KAV
Total Arsenic	9.6	0.11	ug/L		EPA 6020A	3/8/13	MJL
Total Mercury	220	11	ng/L		EPA 245.7	2/26/13	MJL
Total Selenium	2800	13	ug/L		EPA 6010C	3/6/13	KAV

Sample Comments:

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Robert Muehlenkamp
P145

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Thursday, January 23, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 2/20/13 :

Sample Description: **P4 CKD Unit 1 FGD WWTP Effluent**
Sample ID: AD65508 Serial/Impact ID: 0
Sample Collector: NF Sample Collection Date: 2/7/13 Collection Time: 08:02

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Dissolved Arsenic	7.9	0.11	ug/L		EPA 6020A	3/8/13	MJL
Dissolved Mercury <0.2um	110	11	ng/L		EPA 245.7	2/26/13	MJL
Dissolved Mercury <0.45um	96	11	ng/L		EPA 245.7	2/26/13	MJL
Dissolved Selenium	2300	13	ug/L		EPA 6010C	3/1/13	KAV
Total Arsenic	8.2	0.11	ug/L		EPA 6020A	3/8/13	MJL
Total Mercury	150	11	ng/L		EPA 245.7	2/26/13	MJL
Total Selenium	2400	13	ug/L		EPA 6010C	3/6/13	KAV

Sample Comments:

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Robert Muehlenkamp
P145

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Thursday, January 23, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 2/20/13 :

Sample Description: **P4 CKD Unit 1 FGD WWTP Effluent**
Sample ID: AD65515 Serial/Impact ID: 0
Sample Collector: EA Sample Collection Date: 2/13/13 Collection Time: 12:45

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Dissolved Arsenic	6.4	0.11	ug/L		EPA 6020A	3/8/13	MJL
Dissolved Mercury <0.2um	60	11	ng/L		EPA 245.7	2/26/13	MJL
Dissolved Mercury <0.45um	57	11	ng/L		EPA 245.7	2/26/13	MJL
Dissolved Selenium	1700	13	ug/L		EPA 6010C	3/1/13	KAV
Total Arsenic	6.5	0.11	ug/L		EPA 6020A	3/8/13	MJL
Total Mercury	81	11	ng/L		EPA 245.7	2/26/13	MJL
Total Selenium	1700	13	ug/L		EPA 6010C	3/6/13	KAV

Sample Comments:

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Elizabeth Hellman
A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Thursday, January 23, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 3/27/13 :

Sample Description: **P4 FGD WWTP Secondary Clarifier Effluent**
Sample ID: AD66701 Serial/Impact ID:
Sample Collector: EA Sample Collection Date: 3/26/13 Collection Time: 09:00

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Arsenic	11	0.043	ug/L		EPA 6020A	4/1/13	MJL
Total Mercury	180	11	ng/L		EPA 245.7	3/28/13	MJL
Total Selenium	2100	13	ug/L		EPA 6010C	4/2/13	KAV

Sample Comments:

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 8/2/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD71697 Serial/Impact ID:
Sample Collector: BOYD Sample Collection Date: 7/31/13 Collection Time: 08:52

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	41	11	ng/L		EPA 245.7	8/14/13	MJL
Total Mercury Field Duplicate	37	11	ng/L		EPA 245.7	8/14/13	MJL

Sample Comments:

Associated method blanks (2) <mdl.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 8/7/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD71886 Serial/Impact ID:
Sample Collector: BOYD Sample Collection Date: 8/1/13 Collection Time: 14:15

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	39	11	ng/L		EPA 245.7	8/14/13	MJL
Total Mercury Field Duplicate	45	11	ng/L		EPA 245.7	8/14/13	MJL

Sample Comments:

Associated method blanks (2) <mdl.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 8/7/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD71887 Serial/Impact ID:
Sample Collector: BOYD Sample Collection Date: 8/5/13 Collection Time: 13:59

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	52	11	ng/L		EPA 245.7	8/14/13	MJL
Total Mercury Field Duplicate	39	11	ng/L		EPA 245.7	8/14/13	MJL

Sample Comments:

Associated method blanks (2) <mdl.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 8/9/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD71994 Serial/Impact ID:
Sample Collector: BOYD Sample Collection Date: 8/6/13 Collection Time: 14:08

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	41	0.45	ng/L		EPA 245.7	8/14/13	MJL
Total Mercury Field Duplicate	29	0.45	ng/L		EPA 245.7	8/14/13	MJL

Sample Comments:

Associated method blanks (2) <mdl.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 9/19/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD73625 Serial/Impact ID:
Sample Collector: PUDER Sample Collection Date: 9/17/13 Collection Time: 14:40

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	460	13	ng/L		EPA 245.7	9/25/13	MJL
Total Mercury Field Duplicate	470	13	ng/L		EPA 245.7	9/25/13	MJL

Sample Comments:

Associated method blank results: Blank1 1.61 ng/L, Blank2 1.57 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 9/19/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD73626 Serial/Impact ID:
Sample Collector: NF Sample Collection Date: 9/18/13 Collection Time: 09:15

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	390	13	ng/L		EPA 245.7	9/25/13	MJL
Total Mercury Field Duplicate	390	13	ng/L		EPA 245.7	9/25/13	MJL

Sample Comments:

Associated method blank results: Blank1 1.61 ng/L, Blank2 1.57 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 9/26/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD73969 Serial/Impact ID:
Sample Collector: NF Sample Collection Date: 9/24/13 Collection Time: 08:42

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	220	13	ng/L		EPA 245.7	10/4/13	MJL
Total Mercury Field Duplicate	210	13	ng/L		EPA 245.7	10/4/13	MJL

Sample Comments:

Associated method blank results: Blank1 0.62 ng/L, Blank2 0.88 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 9/26/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD73974 Serial/Impact ID:
Sample Collector: NF Sample Collection Date: 9/25/13 Collection Time: 08:50

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	190	13	ng/L		EPA 245.7	10/4/13	MJL
Total Mercury Field Duplicate	170	13	ng/L		EPA 245.7	10/4/13	MJL

Sample Comments:

Associated method blank results: Blank1 0.62 ng/L, Blank2 0.88 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 10/4/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD74497 Serial/Impact ID:
Sample Collector: NF Sample Collection Date: 10/1/13 Collection Time: 09:00

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	170	18	ng/L		EPA 245.7	10/11/13	MJL
Total Mercury Field Duplicate	160	18	ng/L		EPA 245.7	10/11/13	MJL

Sample Comments:

Associated method blank results: Blank1 1.1 ng/L, Blank2 0.92 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 10/4/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD74499 Serial/Impact ID:
Sample Collector: NF Sample Collection Date: 10/3/13 Collection Time: 06:43

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	150	18	ng/L		EPA 245.7	10/11/13	MJL
Total Mercury Field Duplicate	150	18	ng/L		EPA 245.7	10/11/13	MJL

Sample Comments:

Associated method blank results: Blank1 1.1 ng/L, Blank2 0.92 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 10/9/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD74716 Serial/Impact ID:
Sample Collector: NF Sample Collection Date: 10/8/13 Collection Time: 06:47

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	74	18	ng/L		EPA 245.7	10/11/13	MJL
Total Mercury Field Duplicate	70	18	ng/L		EPA 245.7	10/11/13	MJL

Sample Comments:

Associated method blank results: Blank1 1.1 ng/L, Blank2 0.92 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 10/11/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD74815 Serial/Impact ID:
Sample Collector: NF Sample Collection Date: 10/10/13 Collection Time: 07:14

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	96	18	ng/L		EPA 245.7	10/16/13	MJL
Total Mercury Field Duplicate	80	18	ng/L		EPA 245.7	10/16/13	MJL

Sample Comments:

Associated method blank results: Blank1 1.2 ng/L, Blank2 1.0 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 10/17/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD74961 Serial/Impact ID:
Sample Collector: NF Sample Collection Date: 10/16/13 Collection Time: 10:15

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	350	18	ng/L		EPA 245.7	10/23/13	MJL
Total Mercury Field Duplicate	280	18	ng/L		EPA 245.7	10/23/13	MJL

Sample Comments:

Associated method blank results (2) <mdl.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 10/18/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD75008 Serial/Impact ID:
Sample Collector: NFOUCAULT Sample Collection Date: 10/17/13 Collection Time: 07:35

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	200	18	ng/L		EPA 245.7	10/23/13	MJL
Total Mercury Field Duplicate	270	18	ng/L		EPA 245.7	10/23/13	MJL

Sample Comments:

Associated method blank results (2) <mdl.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 10/24/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD75220 Serial/Impact ID:
Sample Collector: NF Sample Collection Date: 10/23/13 Collection Time: 09:22

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	240	18	ng/L		EPA 245.7	10/28/13	MJL
Total Mercury Field Duplicate	240	18	ng/L		EPA 245.7	10/28/13	MJL

Sample Comments:

Associated method blank results (2) <mdl.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 10/25/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD75264 Serial/Impact ID:
Sample Collector: NF Sample Collection Date: 10/24/13 Collection Time: 07:40

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	230	18	ng/L		EPA 245.7	10/28/13	MJL
Total Mercury Field Duplicate	180	18	ng/L		EPA 245.7	10/28/13	MJL

Sample Comments:

Associated method blank results (2) <mdl.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 11/1/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD75471 Serial/Impact ID:
Sample Collector: NF Sample Collection Date: 10/29/13 Collection Time: 08:19

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	210	18	ng/L		EPA 245.7	11/6/13	MJL
Total Mercury Field Duplicate	110	0.72	ng/L		EPA 245.7	11/6/13	MJL

Sample Comments:

Associated method blank results: Blank1 <0.072 ng/L, Blank2 0.87 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 11/5/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD75496 Serial/Impact ID:
Sample Collector: NF Sample Collection Date: 10/31/13 Collection Time: 12:40

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	150	18	ng/L		EPA 245.7	11/6/13	MJL
Total Mercury Field Duplicate	180	18	ng/L		EPA 245.7	11/6/13	MJL

Sample Comments:

Associated method blank results: Blank1 <0.072 ng/L, Blank2 0.87 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 11/7/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD75649 Serial/Impact ID:
Sample Collector: ANDERSON Sample Collection Date: 11/5/13 Collection Time: 13:35

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	120	18	ng/L		EPA 245.7	11/19/13	MJL
Total Mercury Field Duplicate	130	18	ng/L		EPA 245.7	11/19/13	MJL

Sample Comments:

Associated method blank results: Blank1 <0.72, Blank2 0.98 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 11/7/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD75650 Serial/Impact ID:
Sample Collector: NF Sample Collection Date: 11/6/13 Collection Time: 09:11

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	71	18	ng/L		EPA 245.7	11/19/13	MJL
Total Mercury Field Duplicate	78	18	ng/L		EPA 245.7	11/19/13	MJL

Sample Comments:

Associated method blank results: Blank1 <0.72, Blank2 0.98 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 11/14/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD75958 Serial/Impact ID:
Sample Collector: PUDER Sample Collection Date: 11/12/13 Collection Time: 15:15

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	71	18	ng/L		EPA 245.7	11/19/13	MJL
Total Mercury Field Duplicate	83	18	ng/L		EPA 245.7	11/19/13	MJL

Sample Comments:

Associated method blank results: Blank1 <0.72, Blank2 0.98 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 11/15/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD76000 Serial/Impact ID:
Sample Collector: ANDERSON Sample Collection Date: 11/13/13 Collection Time: 13:25

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	73	18	ng/L		EPA 245.7	11/19/13	MJL
Total Mercury Field Duplicate	72	18	ng/L		EPA 245.7	11/19/13	MJL

Sample Comments:

Associated method blank results: Blank1 <0.72, Blank2 0.98 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 11/22/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD76253 Serial/Impact ID:
Sample Collector: ANDERSON Sample Collection Date: 11/20/13 Collection Time: 13:25

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	110	18	ng/L		EPA 245.7	11/26/13	MJL
Total Mercury Field Duplicate	120	18	ng/L		EPA 245.7	11/26/13	MJL

Sample Comments:

Associated method blank results: Blank1 0.91 ng/L, Blank2 0.78 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 11/22/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD76256 Serial/Impact ID:
Sample Collector: ANDERSON Sample Collection Date: 11/19/13 Collection Time: 13:15

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	120	18	ng/L		EPA 245.7	11/26/13	MJL
Total Mercury Field Duplicate	100	18	ng/L		EPA 245.7	11/26/13	MJL

Sample Comments:

Associated method blank results: Blank1 0.91 ng/L, Blank2 0.78 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 11/27/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD76436 Serial/Impact ID:
Sample Collector: ANDERSON Sample Collection Date: 11/25/13 Collection Time: 14:05

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	90	18	ng/L		EPA 245.7	12/9/13	MJL
Total Mercury Field Duplicate	87	18	ng/L		EPA 245.7	12/9/13	MJL

Sample Comments:

Associated Method Blank results: Blank1 <mdl; Blank2 0.91 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 11/27/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD76437 Serial/Impact ID:
Sample Collector: ANDERSON Sample Collection Date: 11/26/13 Collection Time: 09:20

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	80	18	ng/L		EPA 245.7	12/9/13	MJL
Total Mercury Field Duplicate	70	18	ng/L		EPA 245.7	12/9/13	MJL

Sample Comments:

Associated Method Blank results: Blank1 <mdl; Blank2 0.91 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 12/5/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD76692 Serial/Impact ID:
Sample Collector: ANDERSON Sample Collection Date: 12/3/13 Collection Time: 13:35

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	60	18	ng/L		EPA 245.7	12/9/13	MJL
Total Mercury Field Duplicate	61	18	ng/L		EPA 245.7	12/9/13	MJL

Sample Comments:

Associated Method Blank results: Blank1 <mdl; Blank2 0.91 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 12/6/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD76755 Serial/Impact ID:
Sample Collector: ANDERSON Sample Collection Date: 12/4/13 Collection Time: 12:45

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	46	18	ng/L		EPA 245.7	12/13/13	MJL
Total Mercury Field Duplicate	51	18	ng/L		EPA 245.7	12/13/13	MJL

Sample Comments:

Associated Method Blank results: Blank1 0.72, Blank2 0.76 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 12/12/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD77048 Serial/Impact ID:
Sample Collector: ANDERSON Sample Collection Date: 12/10/13 Collection Time: 09:55

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	58	18	ng/L		EPA 245.7	12/13/13	MJL
Total Mercury Field Duplicate	79	18	ng/L		EPA 245.7	12/13/13	MJL

Sample Comments:

Associated Method Blank results: Blank1 0.72, Blank2 0.76 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 12/13/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD77112 Serial/Impact ID:
Sample Collector: ANDERSON Sample Collection Date: 12/11/13 Collection Time: 13:25

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	64	18	ng/L		EPA 245.7	12/23/13	MJL
Total Mercury Field Duplicate	52	18	ng/L		EPA 245.7	12/23/13	MJL

Sample Comments:

Results for associated Hg Method Blanks: Blank1 <mdl, Blank2= 0.74 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 12/19/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD77292 Serial/Impact ID:
Sample Collector: ANDERSON Sample Collection Date: 12/17/13 Collection Time: 14:35

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	37	18	ng/L		EPA 245.7	12/23/13	MJL
Total Mercury Field Duplicate	46	18	ng/L		EPA 245.7	12/23/13	MJL

Sample Comments:

Results for associated Hg Method Blanks: Blank1 <mdl, Blank2= 0.74 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

To: Russ Rick
PSB Annex A231

From: Laboratory Services Division
PSB Annex A070
WDNR Cert # 241329000

Report Date: Wednesday, January 29, 2014

The following are the analytical results for the sample(s) received by Laboratory Services on 12/19/13 :

Sample Description: **PPPP FGD WWTP Sample Pt. 102**
Sample ID: AD77293 Serial/Impact ID:
Sample Collector: ANDERSON Sample Collection Date: 12/18/13 Collection Time: 13:05

Parameter	Result	MDL	Units	Result Flag	Analysis Method	Analysis Date	Analyst
Total Mercury	50	18	ng/L		EPA 245.7	12/23/13	MJL
Total Mercury Field Duplicate	47	18	ng/L		EPA 245.7	12/23/13	MJL

Sample Comments:

Results for associated Hg Method Blanks: Blank1 <mdl, Blank2= 0.74 ng/L.

If there are any questions concerning this report, please contact Kevin Howard at (414) 221-2833.

Enclosure II – Typical Coal Quality Information for Mines Supplying Coal to Pleasant Prairie Power Plant in 2012 and 2013

Caballo

*** 2010 through 2014 ***
TYPICAL ANALYSIS

Raw Basis
Seam Smith
State of Wyoming

Report Data 1/20/10

Proximate Analysis	**As Received**	**Dry**
Moisture	29.7	
Ash	5.1	7.3
Volatile Matter	31.6	44.9
Fixed Carbon	33.6	47.8
BTU	8500	12091
Sulfur	0.33	0.47
MAFBTU	13043	
Lb. SO2/MMBTU	0.78	
Lb. S/MMBTU	0.39	

Ultimate Analysis	
Carbon	69.2
Hydrogen	4.9
Nitrogen	1.0
Chlorine	<0.01
Sulfur	0.47
Ash	7.3
Oxygen	17.13

Sulfur Forms	
Pyritic	0.06
Sulfate	<0.01
Organic	0.41

Water Soluble Alkalies	
Sodium Oxide	0.060
Potassium Oxide	0.003

Equilibrium Moisture	28.2
Free Swelling Index	0.0
Hardgrove Grindability Index @ 26.5% Moisture	72
Mercury Hg ppm (Dry Whole Coal Basis)	0.12
lbs.Hg / trillion Btu's	9.92

Ash Fusion	
Reducing Atmosphere	
Initial Deformation (I.D.)	2135
Softening (H=W)	2150
Hemispherical (H=1/2W)	2165
Fluid	2170
Oxidizing Atmosphere	
Initial Deformation (I.D.)	2180
Softening (H=W)	2190
Hemispherical (H=1/2W)	2200
Fluid	2210

Mineral Analysis Of Ash (Ignited Basis)	
Silica (SiO2)	34.1
Alumina (Al2O3)	16.8
Titania (TiO2)	1.3
Ferric Oxide (Fe2O3)	5.3
Lime (CaO)	21.8
Magnesia (MgO)	4.4
Potassium Oxide (K2O)	0.4
Sodium Oxide (Na2O)	1.5
Phosphorous Pentoxide (P2O5)	1.0
Sulfur Trioxide (SO3)	12.4
Strontium Oxide (SrO)	0.4
Barium Oxide (BaO)	0.6
Manganese Dioxide (MnO2)	<0.1

Alkalies As Na2O	0.13
Base/Acid Ratio	0.64
Silica Value	51.98
Slag Viscosity @ T250	2230
Lb. Ash/MMBTU	6.0
Lb. Na2O/MMBTU	0.09

All analyses are subject to revision due to additional coring, conditions specified in the coal supply agreement, actual operating conditions at time of mining, type of preparation at time of mining, or federal and state regulations. Analysis intended for informational purposes only.

Source Of Information	*Proximate analysis based on mine model by F. Visger and K. Lohkamp.* *Remainder of analysis based on production data base samples and core data.*

Prepared by W.B. Emke

CORDERO ROJO MINE
TYPICAL QUALITY SPECIFICATIONS

QUALITY PARAMETER	TYPICAL (MEAN VALUE)	STANDARD DEVIATION	TYPICAL 95% RANGE -2 STD DEV	+2 STD DEV	TYPICAL DRY VALUE	TYPICAL MOISTURE-ASH FREE VALUE
PROXIMATE						
% Moisture	29.59	0.70	28.19	30.99		
% Ash	5.43	0.59	4.24	6.62	7.71	
% Volatile	30.91	1.06	28.79	33.03	43.90	47.57
% Fixed Carbon	33.85	1.45	30.95	36.75	48.08	52.10
BTU/lb	8450	97.67	8255	8645	12015	13020
MAFBTU	13020		13020	13020		
Dry BTU	12015	93.67	11828	12203		
% Sulfur	0.34	0.04	0.24	0.39	0.45	0.48
ULTIMATE						
% Moisture	29.59	0.70	28.19	30.99		
% Carbon	49.22	1.30	46.62	51.82	69.91	75.75
% Hydrogen	3.41	0.21	2.99	3.83	4.84	5.25
% Nitrogen	0.77	0.17	0.43	1.11	1.09	1.19
% Chlorine	0.01	0.01	0.00	0.03	0.01	0.02
% Sulfur	0.31	0.04	0.24	0.39	0.45	0.48
% Ash	5.43	0.59	4.24	6.62		
% Oxygen	11.02	1.01	9.00	13.04	15.65	16.96
SULFUR FORMS						
Pyritic Sulfur (%)	0.03	0.02	0.00	0.07	0.04	0.05
Sulfate Sulfur (%)	0.002	0.006	0.000	0.014	0.003	0.003
Organic Sulfur (%)	0.28	0.02	0.25	0.31	0.40	0.43
Total Sulfur (%)	0.31	0.04	0.24	0.39	0.45	0.48
MINERAL ANALYSIS OF ASH						
% Silicon Dioxide (Silica, SiO2)	33.95	4.24	25.47	42.43		
% Aluminum Oxide (Alumina, Al2O3)	17.91	1.78	14.35	21.47		
% Titanium Dioxide (Titania, TiO2)	1.48	0.17	1.14	1.82		
% Iron Oxide (Ferric Oxide, Fe2O3)	5.07	0.71	3.65	6.49		
% Calcium Oxide (Lime, CaO)	22.42	3.29	15.84	29.00		
% Magnesium Oxide (Magnesia, MgO)	3.99	0.67	2.65	5.33		
% Potassium Oxide (K2O)	0.37	0.16	0.05	0.69		
% Sodium Oxide (Na2O3)	1.39	0.23	0.93	1.85		
% Sulfur Trioxide (SO3)	9.99	2.50	4.99	14.99		
% Phosphorous Pentoxide (P2O5)	0.94	0.28	0.38	1.50		
% Strontium Oxide (SrO)	0.41	0.09	0.23	0.59		
% Barium Oxide (BaO)	0.63	0.13	0.37	0.89		
% Undetermined	1.20	1.81	0.00	4.82		
Base/Acid Ratio	0.64	0.13	0.38	0.90		
Base Value	33.23	4.14	24.95	41.51		
Acid Value	53.33	5.30	42.73	63.93		
ASH FUSION TEMPERATURES						
Reducing (^{O}F)						
Initial	2145	60	2025	2265		
Softening (H=W)	2165	60	2045	2285		
Hemispherical (H=1/2W)	2175	65	2045	2305		
Fluid	2205	85	2035	2375		
Fluid-Initial Temp. Difference	60	30	0	120		
Oxidizing (^{O}F)						
Initial	2205	55	2095	2315		
Softening (H=W)	2220	60	2100	2340		
Hemispherical (H=1/2W)	2230	65	2100	2360		
Fluid	2260	85	2090	2430		
Fluid-Initial Temp. Difference	55	30	0	115		

CORDERO ROJO COAL MINE
QUALITY SPECIFICATIONS (Continued)

QUALITY PARAMETER	TYPICAL (MEAN VALUE)	STANDARD DEVIATION	TYPICAL 95% RANGE -2 STD DEV	+2 STD DEV
ADDITIONAL ANALYSES AND CALCULATED VALUES				
T250 Temperature (^{O}F)	2190	110	1970	2410
HGI (at as-received moisture)	74	10	54	94
HGI % Moisture	26.11	4.60	17	35
Critical Viscosity Temperature (^{O}F)	NA			
Critical Viscosity (Poises)	NA			
% Equilibrium Moisture	28.24	1.29	25.66	30.82
Specific Gravity	1.26	0.02	1.22	1.30
%Alkalies NA2O Dry (Total Alkali Content	0.122	0.018	0.086	0.158
%Water Soluble Alk - Na2O	0.053	0.010	0.033	0.073
%Water Soluble Alk - K2O	0.003	0.002	0.000	0.007
%Na2O - Dry Coal	NA			
%Na2O As-received Coal	NA			
Silica Value (Silica Ratio)	51.88	6.12		
Slag Factor	0.29	0.06	0.17	0.41
Slag factor per Fusion Temperature	2162	59	2044	2280
Dolomite Ratio	79.28	2.47	74.34	84.22
Ash Precipitation Index	24.32	3.04	18.24	30.40
Silica to Alumina Ratio	1.90	0.21	1.48	2.32
Calcium to Silica Ratio	0.68	0.16	0.36	1.00
Iron to Calcium Ratio	0.23	0.04	0.16	0.30
Fouling Factor (Fouling Index)	NA			
SO2/MMBTU	0.80	0.09	0.57	0.91
lbs S/MMBTU	0.37	0.04	0.28	0.46
lbs Sodium/MMBTU	0.089	0.03	0.04	0.14
lbs Ash/MMBTU	6.42	0.75	4.91	7.93

TYPICAL COAL SIZE 3 inch

Size Fraction	Wt. Percent	Cumulative Wt. Percent	Wt. Percent Passing Top
+3" RD.	1%	1%	100%
3" RD. x 2" RD.	10%	11%	99%
2" RD. x 1" RD.	20%	31%	89%
1" RD. x 1/2" RD.	21%	52%	69%
1/2" RD. x 4 M	20%	72%	48%
4 M x 60 M	20%	92%	28%
60 M x 0	8%	100%	8%
	100%		

TRACE ELEMENT SUMMARY

Parts Per Million Whole Coal, Dry Basis	TYPICAL (MEAN VALUE)	STANDARD DEVIATION	TYPICAL 95% RANGE -2 STD DEV	+2 STD DEV
ANTIMONY (Sb)	0.83	0.31	0.21	1.45
ARSENIC (As)	1.17	0.32	0.53	1.81
BARIUM (Ba)	304.65	137.49	29.67	579.63
BERYLLIUM (Be)	0.26	0.08	0.10	0.42
BORON (B)	30.80	4.32	22.16	39.44
BROMINE (Br)	14.92	6.56	1.80	28.04
CADMIUM (Cd)	0.18	0.04	0.10	0.26
CHLORINE (Cl)	11.36	7.15	0.00	25.66
CHROMIUM (Cr)	6.23	2.06	2.11	10.35
COBALT (Co)	2.74	2.05	0.00	6.84
COPPER (Cu)	10.96	4.29	2.38	19.54
FLUORINE (F)	48.08	16.08	15.92	80.24
LITHIUM (Li)	4.47	1.90	0.67	8.27
MANGANESE Mn)	18.04	13.70	0.00	45.44
MERCURY (Hg)	0.073	0.028	0.017	0.129
MOLYBDNEUM (Mo)	2.50	1.02	0.46	4.54
NICKEL (Ni)	4.50	1.45	1.60	7.40
LEAD (Pb)	4.01	1.25	1.51	6.51
SELENUIM (Se)	0.98	0.14	0.70	1.26
SILVER (Ag)	0.18	0.04	0.10	0.26
STRONTIUM (Sr)	316.75	247.14	0.00	811.03
THALLIUM (Tl)	0.82	0.46	0.00	1.74
THORIUM (Th)	2.05	0.50	1.05	3.05
TIN (Sn)	1.20	0.40	0.40	2.00
URANIUM (U)	0.57	0.48	0.00	1.53
VANADIUM (V)	16.42	12.32	0.00	41.06
ZIRCONIUM (Zr)	7.45	9.29	0.00	26.03
ZINC (Zn)	7.04	2.68	1.68	12.40

*** All negative numbers were converted to 0.00**

ROCHELLE / NORTH ANTELOPE

*** 2011 through 2015 ***
TYPICAL ANALYSIS

Raw Basis **Report Data 3/31/11**
Seam Wyodak-Anderson
State of Wyoming

Proximate Analysis	**As Received**	**Dry**
Moisture	27.3	
Ash	4.6	6.2
Volatile Matter	31.6	43.5
Fixed Carbon	36.5	50.3
BTU	**8800**	12104
Sulfur	0.21	0.29
MAFBTU	12904	
Lb. SO2/MMBTU	0.48	
Lb. S/MMBTU	0.24	

Ultimate Analysis	
Carbon	69.9
Hydrogen	4.8
Nitrogen	0.9
Chlorine	<0.01
Sulfur	0.29
Ash	6.2
Oxygen	17.91

Sulfur Forms	
Pyritic	0.02
Sulfate	<0.01
Organic	0.27

Water Soluble Alkalies	
Sodium Oxide	0.077
Potassium Oxide	0.004

Equilibrium Moisture	26.2
Free Swelling Index	0.0
Hardgrove Grindability Index @ 25.5% Moisture	65
Mercury Hg ppm (Dry Whole Coal Basis)	0.06
lbs.Hg / trillion Btu's	4.96

Ash Fusion	
Reducing Atmosphere	
Initial Deformation (I.D.)	2135
Softening (H=W)	2145
Hemispherical (H=1/2W)	2155
Fluid	2185
Oxidizing Atmosphere	
Initial Deformation (I.D.)	2195
Softening (H=W)	2200
Hemispherical (H=1/2W)	2210
Fluid	2235

Mineral Analysis Of Ash (Ignited Basis)	
Silica (SiO2)	32.6
Alumina (Al2O3)	16.5
Titania (TiO2)	1.3
Ferric Oxide (Fe2O3)	5.6
Lime (CaO)	24.0
Magnesia (MgO)	5.5
Potassium Oxide (K2O)	0.4
Sodium Oxide (Na2O)	1.8
Phosphorous Pentoxide (P2O5)	1.2
Sulfur Trioxide (SO3)	10.1
Strontium Oxide (SrO)	0.3
Barium Oxide (BaO)	0.7
Manganese Dioxide (MnO2)	<0.1

Alkalies As Na2O	0.13
Base/Acid Ratio	0.74
Silica Value	48.2
Slag Viscosity @ T250	2170
Lb. Ash/MMBTU	5.1
Lb. Na2O/MMBTU	0.09

All analyses are subject to revision due to additional coring, conditions specified in the coal supply agreement, actual operating conditions at time of mining, type of preparation at time of mining, or federal and state regulations. Analysis intended for informational purposes only.

Source Of Information	*Proximate analysis based on mine model by K. Lohkamp & F. Visger. Approximate blend 9% Middle, 33% South, 35% North and 23% East*

Prepared by W.B. Emke